REMARKS/ARGUMENT

By the foregoing amendment, claims 1 and 15 have been combined and appropriate conforming changes have been made to other claims. As pointed out on page 4, lines 20-30 of the application, kinetic measurements are direct and continuous measurements of a measurable property or effect associated with the bound component at a time before the assay reaches substantially steady state. In addition, a new claim has been added paralleling claim 7 but whereas claim 7 calls for calibrating the assay system for the samples of known analyte concentration, the new claim uses calibration data previously determined.

Claims 1-5, 12, 13, and 15 were rejected under 35 U.S.C. § 103 over Tosa and claims 6, 7 and 14 were rejected under 35 U.S.C. § 103 over Tosa combined with Sutherland. Both of these rejections are respectfully traversed.

The present invention is concerned with a kinetic assay during the course of which a component of the system becomes at least partially bound, directly or indirectly, to the surface of a solid body. The Applicants recognized that during the course of such an assay, a reliable measurement of the bound or absorbed component, i.e., without interference from the free component in the assay system, can be obtained by direct continuous monitoring of the component. This allows an indication of the unknown ligand concentration to be obtained at a very early stage of the incubation period without the need to wait for an arbitrarily determined end point, such as the equilibrium steady state condition. As a result, the operator can observe the result continuously and judge whether it is worthwhile taking further readings in an attempt to improve the accuracy of the results. This continuous monitoring also allows random errors caused by problems with instrumentation, for instance, to be readily identified.

Claim 1 recites the three steps involved in the invention. First, an analyte dependent parameter (such as, for example, a fluorescent emission) is measured kinetically in a direct and continuous manner from a time after the onset of incubation. In the second step, the measured kinetic data is manipulated to quantitatively determine the unknown sample and in the third step, the results of the determination are monitored continuously. There is no teaching or suggestion of this method in the cited references.

The Tosa reference relates to a method for an optical immunoassay employing a signal from a labeled antibody and the differential value by time of the signal at the initial stage and the

steady state (equilibrium point of time) is employed. In the procedures described, the measured parameter or signal is effectively manipulated to quantitatively determine the unknown sample only once. That event takes place either at saturation (the steady state point) or a time which is deemed sufficiently long to obtain a value that is nearly saturated. While it can be argued that Tosa continuously collects data throughout the assay, such data is only processed at a single point of time deemed to be the end of the assay. In the present invention, the data continuous generated is manipulated and the results of the determination is monitored continuously. While the data in Tosa may be manipulated, the results of the manipulation are viewed only once. There is no suggestion of continuous monitoring.

It will be noted further that the present invention is based on the use of kinetic non-steady state data and allows concentration to be derived relatively quickly. In contrast, the Tosa system is based on the presence of at least two signals to determine concentration, one of which is the steady state signal corresponding to the end of the immunity reaction, and therefore, steady state data is essential.

Sutherland relates to the use of an optical wave guide for optically ascertained parameters of a species and a liquid analyte. It, like Tosa, always uses steady state measurements to establish a relationship between those values.

In the previous Office Action, it was asserted that Tosa teaches measurements being performed at specific intervals of the immunological reaction and further teaches manipulation of the kinetic data in that a differential value by time is calculated. It is respectfully submitted that to the extent that this is true, it does not meet the requirements of the instant claims. Those claims indicate that data is being collected (measured) directly and continuously and that the results of a determination resulting from the manipulation of that data is also being monitored continuously. Since Tosa looks at the results of the determination made only once, it is clear that the results are not being monitored continuously.

The prior Office Action also asserts that "the method as claimed only requires the actual measurement of kinetic data" and that "any further manipulation of the so collected data would amount to mental steps and mathematical calculations and correlations, which mental steps cannot be relied upon to lend patentability of the claimed method." It is respectfully submitted that these assertions are not well taken.

As to the first assertion, it is respectfully pointed out that the measurement of the parameter and generation of kinetic data is only the first of three steps recited in the claim. The claims also call for manipulation of the kinetic data and continuous monitoring of the manipulated data.

With respect to the second assertion, Applicants are not aware of any legal basis or precedent for the apparent position that a process step which can be characterized as a mental step or mathematical calculation or correlation can be ignored when considering the patentability of a method claim. To the contrary, U.S.C. Title 35 as well as the PTO rules require that the invention be considered "as a whole". Indeed, M.P.E.P. § 2143.03 points out that "all claim limitations must be taught or suggested by the prior art" and that even a claim limitation which is indefinite or may not find support in the specification as originally filed **must** be considered. See also, AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1359, 50 U.S.P.Q. 2d 1147, 1452 (Fed. Cir. 1999) ("Excell also contends that because the process claims at issue lack physical limitations set forth in the patent, the claims are not patentable subject matter. This argument reflects a misunderstanding of our case law. . . .Since the claims at issue in this case are directed to a process in the first instance, a structural inquiry is unnecessary.")

The last Office Action in this case appears to acknowledge (correctly) that the recited manipulation of the collected data is neither taught nor suggested in the applied references. Those steps in the claims cannot be ignored. It is therefore respectfully submitted that the rejection should be withdrawn.

It is respectfully submitted that this application is now in condition to be allowed and the early issuance of a Notice of Allowance is respectfully solicited.

Respectfully submitted,

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APPENDIX A
Version With Markings To Show Changes Made
37 C.F.R. § 1.121(b)(1)(iii) AND (c)(1)(ii)

CLAIMS:

1. A method of assay in which a component becomes at least partly bound to a solid body characterised in that an analyte dependent parameter associated with said component is <u>kinetically</u> measured in a direct and continuous manner <u>from a time after the onset of incubation and before the assay reaches a substantially steady state</u> and in that [said] <u>the resulting</u> measured analyte dependent [parameter] <u>kinetic data</u> is manipulated to quantitatively determine an unknown sample and in that the results of the determination are monitored continuously.

7. A method as claimed in claim 1 comprising the steps of

(a) calibrating the assay system for x samples, each of known analyte concentration (C_a), by measuring continuously for each sample independently at a plurality of times (t_y) after the onset of incubation the value of [an] <u>said</u> analyte-dependent [parameter] <u>kinetic data</u> (P_z),

(b) for an analyte of unknown concentration (C_b) measuring continuously in independent values of [an] <u>said</u> analyte-dependent parameter (P_d) each at time t_e after the onset of incubation,

(c) combining the data (P_d, t_e) from step (b) with the calibration data (P_z, t_y, C_a) from step (a) to calculate the unknown dose of analyte (C_b) at time t_e.